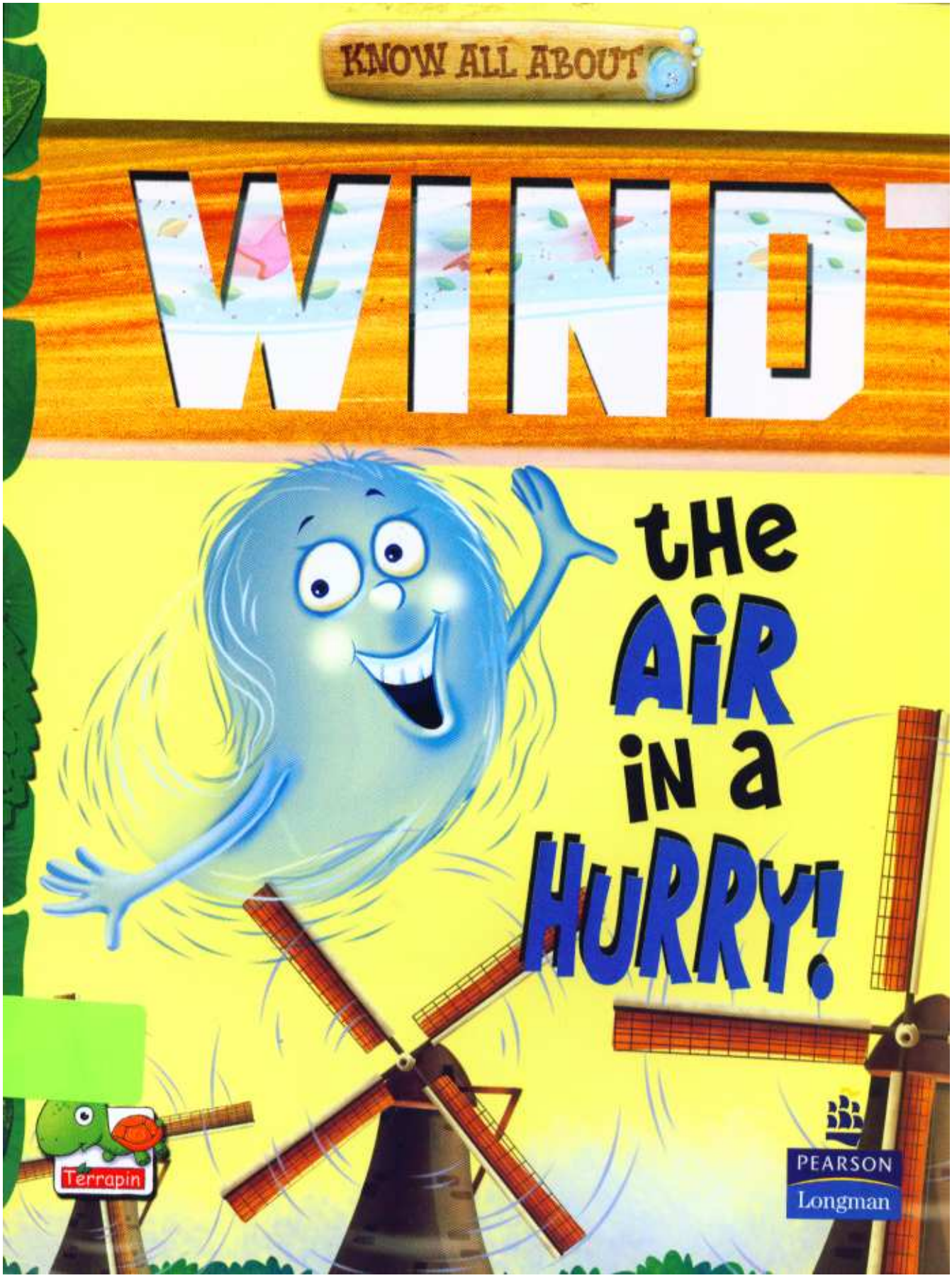

KNOW ALL ABOUT
WIND
the AiR in a HURRY!
Terrapin
PEARSON
Longman

First published in 2008 by
The Energy and Resources Institute
TERI Press
Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi - 110 003, India
Tel. 2468 2100/4150 4900, Fax: 2468 2144/2468 2145
India +91 • Delhi (0)11
Email: teripress@teri.res.in • Website: http://bookstore.teriin.org

© The Energy and Resources Institute, 2008

ISBN 978-81-7993-173-8

All rights reserved. No part of this publication may be reproduced in any form or by any means without the prior permission of The Energy and Resources Institute.

The marketing and distribution rights for this book for the Indian subcontinent lie exclusively with Pearson Education, a division of DORLING KINDERSLEY (INDIA) PVT. LTD, licensees of Pearson Education in South Asia.

Author: Tripti Nainwal
Managing Editor: Madhu Singh Sirohi
Series Editor: Pallavi Sah
Senior Editor: Arshi Ahmed
Technical Review: Vibha Dhawan
Art Direction and Design: Priyabrata Roy Chowdhury
Illustration: Yatindra Kumar and Vijay Nipane
Image Researcher: Yukti Garg
Production: T Radhakrishnan
Prepress: Mahfooz Alam

Printed and bound in India

This book is printed on recycled paper

WIND

the AIR in a HURRY!

PEARSON
Longman

HURRY, AIR, HURRY

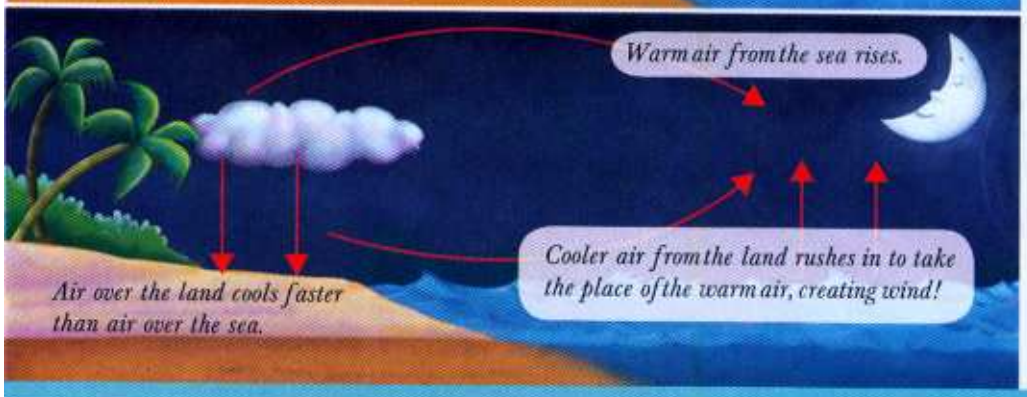
You can feel it but never see it
Sometimes hear and sometimes smell it.
Try to hold it, and there's nothing there,
And yet, you see, it's everywhere!!
What is it?
It's the wind!

Wind is simply air in motion. It is air that's always in a hurry!

HOW WIND IS FORMED

The warm air rises
Air over the land heats up faster than air over the sea.
The cooler air from the sea takes the place of the warm air, creating wind!

During the day


Warm air from the sea rises.
Cooler air from the land rushes in to take the place of the warm air, creating wind!
Air over the land cools faster than air over the sea.

During the night

Where does the wind blow from?

It is the sun, land, and water that come together to create wind. During the day, when the sun shines, it heats up the land. But as the earth is made up of different types of land (like the desert or the mountains), some types get heated faster and the others, slower. Water heats up last, so the air over the ocean remains cooler than the air over land.

A windy story

As the air over the land gets heated, it starts rising. The air over the ocean that is still cool, rushes in to take its place. This movement of cool air, rushing in to take the place of the warm air, is what causes the wind.

Wind can be used to do lots of fun stuff! We can fly kites, play wind instruments like the flute or the trumpet or go hand gliding and parachuting!

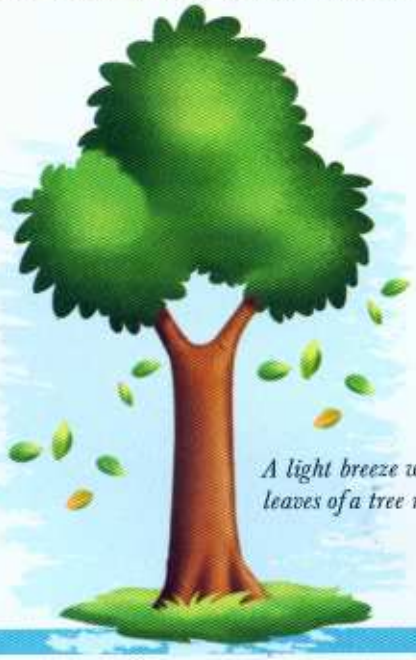
FUNNEE !

The ancient Greeks thought that wind was the earth breathing in and out!

The strength of wind depends on how fast heated air rises. If it rises quickly, the wind is strong. If it rises slowly, we have a light, gentle breeze.

Is it a breeze...is it a storm?!

Wind is called breeze, gale or storm according to its speed. If you look outside and see the leaves on a tree moving gently, you can call it a light breeze. If the whole tree is shaking, then it is a strong breeze. When branches from the tree start breaking off, we have a gale. And gosh! If the whole tree falls down...then it is a storm!



A light breeze will make leaves of a tree rustle.

A strong breeze will make the whole tree shake.

WIND:
THE AIR IN A HURRY
4-5
DID YOU KNOW ?
The wind is strongest in Antarctica. Here it blows at speeds of more than hundred kilometres per hour for five months of the year!

Setting the standard

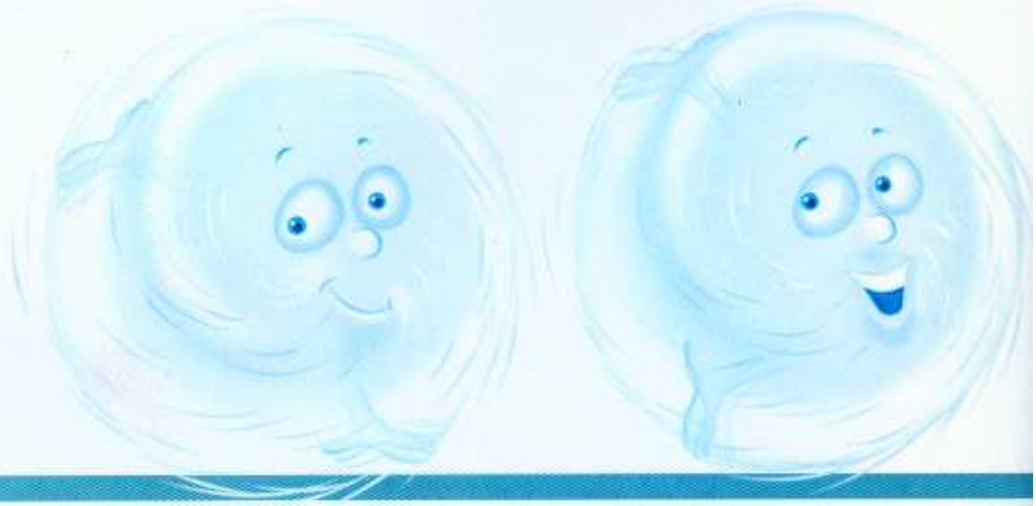
Around 1806, Sir Francis Beaufort, a commander in the British Navy, created the Beaufort scale. It measures the wind according to its strength. Now, sailors all over the world know that a Force 10 on a Beaufort scale means a storm, but a Force 12 warning means that a hurricane is approaching!

A gale will break off branches of a tree.
A storm can break or blow away a tree.
Wind can be gentle. But it can also be very strong!

In its strongest form, wind can be either a hurricane or a tornado. Hurricane winds can reach speeds of up to three hundred kilometres per hour!

How hurricanes happen

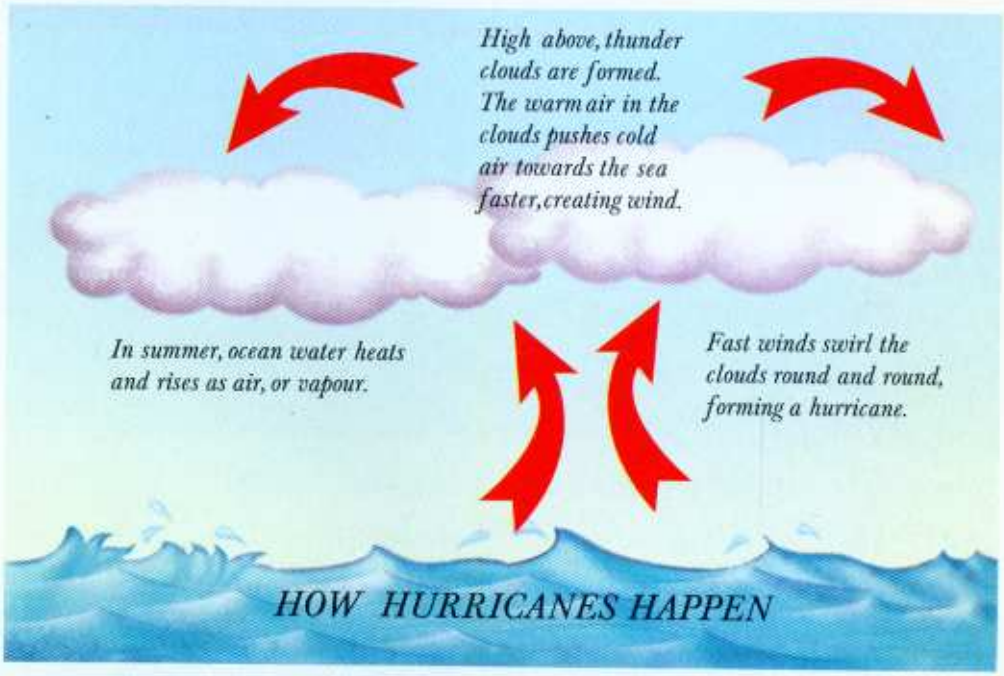
Sometimes, in warm humid areas, when the sea gets very hot, warm air starts rising rapidly. Cool air rushes in equally fast. If the air rushing in is blowing in the same direction and at the same speed, it pushes the warm air upwards at great speeds, often forming massive clouds. These clouds can spin out of control, and swirling winds over the sea start moving towards the coast.



When wind gets very strong, it can get very dangerous. In its strongest form, it can be either a hurricane or a tornado.

OOH, IT'S THE STRONGEST ONE!

Hurricanes usually occur in summer or autumn, when the ocean water is warm enough.


High above, thunder clouds are formed. The warm air in the clouds pushes cold air towards the sea faster, creating wind.
In summer, ocean water heats and rises as air, or vapour.
Fast winds swirl the clouds round and round, forming a hurricane.

HOW HURRICANES HAPPEN

Run!

Combined with heavy rain and flashes of lightning, these strong winds and huge waves can cause great damage to both sea life and people. The fierce winds batter trees and can bring down buildings.

BELIEVE IT OR NOT!

Indians refer to hurricanes as cyclones. In Japan, they are called typhoons. In Australia, they are known as willy-willys!

TORNADOES ... TERRIBLE TWISTERS!

Both tornadoes and hurricanes have whirling winds and can sometimes look the same. However, hurricanes start from the sea and move towards the land, while tornadoes begin from the sky and stretch down towards the ground.

Sucked in!

Tornadoes occur when hot, moist air in the atmosphere comes into contact with cool dry air. This, sometimes, creates a funnel-shaped cloud that rotates violently as it stretches down from a massive thundercloud. It hits land with a loud roar and continues to move along the ground, pulling in everything that comes in its path. Tornadoes can lift cars, destroy buildings, and even overturn trains!

FUNNEE !

Do you know the story 'Wizard of Oz'? Yes, it was a tornado that carried Dorothy and her dog away from her home to the land of Oz.

TWISTING INTO A TORNADO

Warm, moist air rises up. There, it meets cold, dry air, and a thunder cloud is formed.

Winds blowing from other directions may spin the thunder cloud. As it spins faster and faster, a tornado is formed.

Hide!

Some places are often hit by tornadoes. People who live in such areas build basements in their houses. When they are warned of an approaching tornado, they go down to the basement and stay there until the tornado moves ahead. It is a good idea to stock the basement with a first-aid kit and food.

WIND AS FRIEND: THE GOOD SIDE!

Brrr! Hurricanes and tornadoes sure sound scary! But you know what? Wind is not all bad. In fact, it can be the best friend man ever had.

Even before 3200 BC, the ancient Egyptians used wind to sail ships on the river Nile.

Man's best friend?

It is the wind that carries seeds from plants to the different parts of the world. This is one of the reasons that food and flowers grow all over the earth. When plants are not brightly coloured, insects often ignore them. The wind is especially helpful in spreading the seeds that belong to these dull but equally important plants.

DID YOU KNOW ?

On August 3, 1492, Christopher Columbus set sail from Spain with three small Spanish sailing ships—the Pinta, the Niña, and the Santa María. His plan was to reach India, but he discovered America instead!

Early ships, with sails, depended entirely on the wind's speed and direction to ferry them across.

Sailors ahoy!

In the olden days, it was wind that helped people sail across oceans and discover new lands. The ships moved forward as wind hit the sails. Later, sailing ships were able to use wind to travel greater distances. Discovery, fishing, and trade were all made possible due to this simple form of energy.

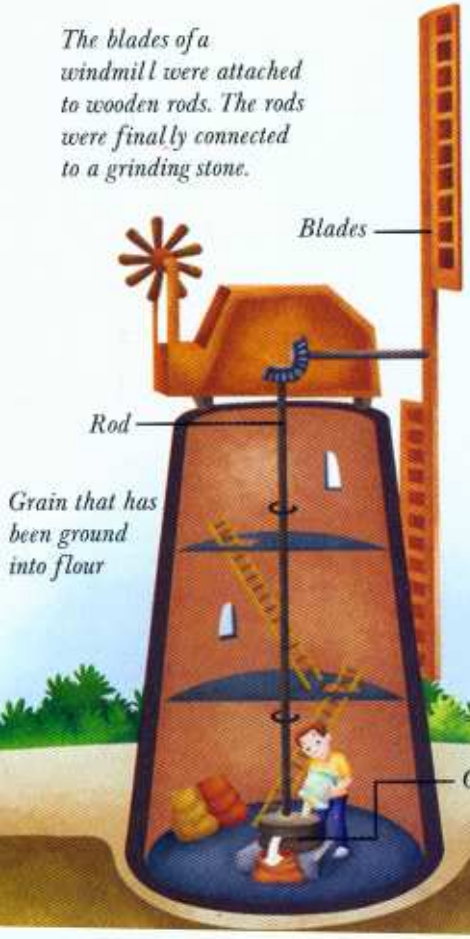
WINDMILLS: PRETTY AS A PICTURE

Have you ever seen pictures of a country called Holland? They have beautiful flowers, colours, and almost always...a picture of a windmill! Holland is famous for its windmills!

These beauties work hard!

These windmills are so pretty to look at, and they actually do a lot of work for us! Long ago, when there were hardly any machines, windmills helped make life easier for us. A windmill is a machine that is powered by wind energy.

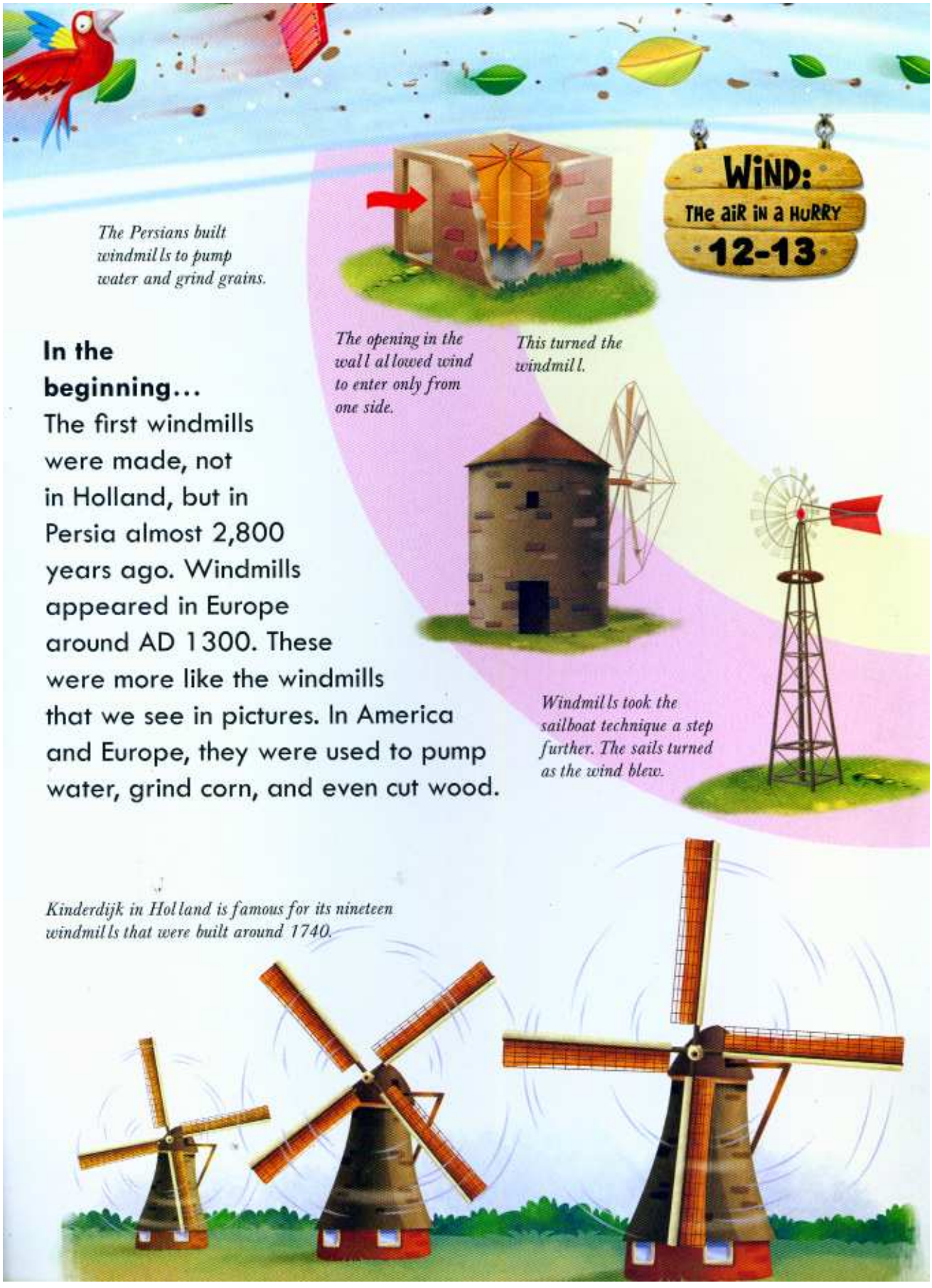
The blades of a windmill were attached to wooden rods. The rods were finally connected to a grinding stone.



As wind hit the blades, the rods turned. This rotation led to the turning of the grinding stone, and grain was ground without any human effort!

DID YOU KNOW ?

The Greek island of Crete has more than a hundred windmills that pump water for crops and cattle. Most of them are still in use!



The Persians built windmills to pump water and grind grains.

The opening in the wall allowed wind to enter only from one side.

This turned the windmill.

In the beginning...

The first windmills were made, not in Holland, but in Persia almost 2,800 years ago. Windmills appeared in Europe around AD 1300. These were more like the windmills that we see in pictures. In America and Europe, they were used to pump water, grind corn, and even cut wood.

Windmills took the sailboat technique a step further. The sails turned as the wind blew.

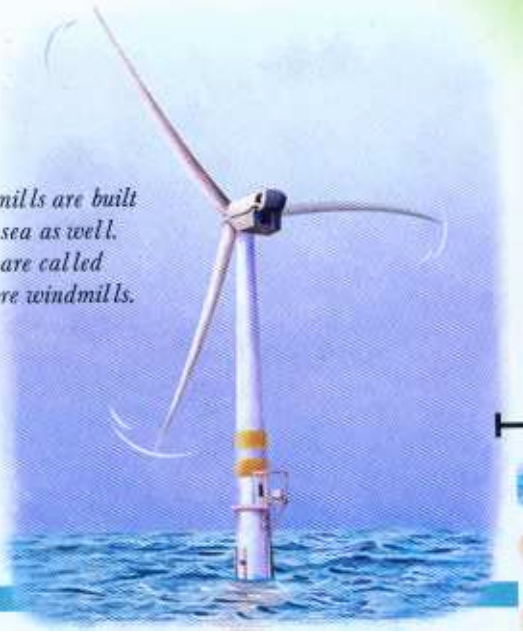
Kinderdijk in Holland is famous for its nineteen windmills that were built around 1740.

WIND POWER!

Today, we use wind energy to make electricity. America used wind to produce electricity as early as the 1920s. But when electricity made from coal and oil became popular, people forgot about the power of wind!

A fuel called wind

Many years later, oil supply started running out and people began to worry about the harm they had caused to the environment. Then, they started to look for other sources of energy that were less harmful. Here, wind energy came out tops!



Windmills are built in the sea as well. These are called offshore windmills.

DID YOU KNOW ?

The largest wind machine in the world is being set up in the North Sea near Scotland! Its blades are the length of almost two football fields!

Flat, open areas, where the wind blows at more than twenty kilometres per hour, are chosen for wind farms.

Wind is a renewable energy source. This means that our quota of wind cannot be finished. As long as the sun shines on the earth, there will be wind.

Windmills again!

The wind machines of today are called wind turbines. They are usually built of steel, with fibreglass blades instead of wood. To provide electricity to many people, wind farms are built. These are open areas with a number of wind machines. Wind farm owners must build their farms in areas that have a lot of wind.

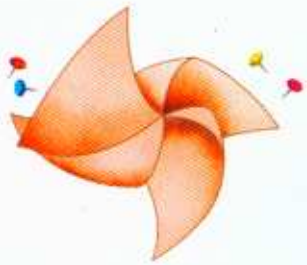
WIND:
THE AIR IN A HURRY
16

PINWHEEL WIND COLLECTOR

The pinwheel is an example of a wind collector.

You will need

• A pin • Scissors • A sharpened pencil with an eraser at one end
• Square piece of construction paper (about 8.5 inches x 8.5 inches)



Make it so

- Draw a line diagonally from each corner to the opposite corner of the construction paper.
- Punch a small hole through the centre of the square.
- Cut along each line, stopping about an inch from the hole in the centre.
- Using the pin, punch a hole in the top left corner of each of the four flaps.
- Lift the punched corner of each flap and carefully curve it toward the centre hole. Repeat this for the other flaps.
- Hold all the four punched corners in the centre with the pin. The point should come out through the back.
- When all four flaps are held by the pin, carefully lift the paper without letting the flaps unfurl.
- Push the point of the pin into the side of the eraser. Your pinwheel is ready!

INDEX

air 2, 3, 6, 7
Beaufort scale 5
breeze 4
Christopher Columbus 11
cyclones 7
Egyptians 10
electricity 14, 15
gale 4, 5
Holland 12, 13
hurricane 6, 7, 8, 10
lightning 7
Persians 13
renewable energy 15
tornado 6, 8, 9, 10
typhoons 7
wind energy 12, 14
windfarm 12
windmill 12, 13, 14, 15
wind turbine 15
Wizard of Oz 8

THIS IS A
GREEN
BOOK

S/566

WIND

the AIR in a HURRY!

Can you see the wind? No, but you can always feel it, and sometimes hear and smell it too! So, what is the wind? Wind can be our worst enemy but also our best friend? It creates hurricanes, but can also be used to create electricity.

Read about these and discover many more fascinating facts about wind!

Other books in this series:

Sun: The Great Ball of Fire!
Water: The Big Splash!
Soil: The Precious Earth!
Space: The Great Beyond!
Earth: The Blue Marvel!

S/566

teri

ISBN 978-81-7993-173-8

9 788179 931738

MRP Rs 75

This book is printed on recycled paper

Ages: 8-12

PEARSON Longman

PEARSON EDUCATION
a division of DORLING KINDERSLEY (INDIA) PVT LTD
Licensees of Pearson Education in South Asia
Head Office: 482 FIE Patparganj, Delhi 110 092, India